

PATENT

Best Available Copy

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants(s): Thomas Pratt, et al.
 Patent No.: 6,712,907
 Issue Date: March 30, 2004
 Serial No.: 09/887,202
 Filing Date: June 21, 2001
 Title: Magnetically Coupled Linear Servo-Drive Mechanism
 Atty. Docket No.: 10001.001100 (NVLS 432)

Attn: Certificate of Correction Branch
 Commissioner For Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

Certificate
 APR 28 2004
 of Correction

REQUEST FOR CERTIFICATE OF CORRECTION

Sir:

The Following errors, as more fully described below, appear in this patent.

The Applicant submits that no fee is due for correction of the errors made by the Patent and Trademark Office; OR,

The errors occurred in good faith. Correction thereof does not involve such changes in the patent as would constitute new matter or would require re-examination. A Certificate of Correction is requested. Enclosed herewith is payment in the amount of \$____ to cover the fee for this Certificate of Correction.

Attached hereto are duplicate Forms PTO/SB/44, with at least one copy that is suitable for printing.

APR 28 2004

Applicant kindly requests the following changes:

Claim 1 should read:

A semiconductor wafer processing system, comprising:
a reactor for processing at least one semiconductor wafer;
at least one load lock coupled to the reactor; and
a magnetically coupled linear servo-drive mechanism located within the at least one load lock to transfer wafers to and from the reactor, the servo-drive mechanism comprising:
a carriage for holding a wafer;
a driven magnet array within the carriage;
a guiding mechanism for guiding the carriage linearly;
a cylindrical tube housing a linear actuator and isolating the actuator from a wafer environment in the load lock, a driving magnet array inside the cylindrical tube and mounted to an output of the linear actuator, the driving magnet array magnetically coupled to the driven magnet array mounted within the carriage;
an engine coupled to the actuator to drive the actuator; and
a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration; and
wherein the driven magnet array forms a magnetic rotation lock with the driving magnet array.

Claim 10 should read:

A magnetically coupled linear servo-drive mechanism for use in a load lock of a semiconductor fabrication system, comprising:
a carriage having a first magnet array;
a guiding mechanism for guiding the carriage linearly;
a cylinder housing an actuator, the actuator magnetically coupled to the carriage using a second magnet array;
an engine coupled to the actuator to drive the actuator; and
a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration; and
wherein the first magnet array forms a magnetic rotation lock with the second magnet array.

Claim 19 should read:

A method for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:
placing a wafer on a carriage, the carriage having a first magnet array;
magnetically coupling an actuator to the carriage using a second magnet array to allow propulsion of the carriage, the actuator isolated from a vacuum environment;

forming a magnetic rotation lock between the first magnet array and the second magnet array; and translating the actuator linearly.

The requested corrections are based on the Response to Final Office Action filed on September 10, 2003, a copy of which is enclosed and marked as Exhibit A.

Please send the Certificate to:

Patrick Benedicto
 Okamoto & Benedicto LLP
 P.O. Box 641330
 San Jose, CA 95164-1330

Respectfully submitted,
 Pratt, et al.

Dated: April 22, 2004

By: Patrick Benedicto
 Patrick D. Benedicto, Reg No. 40,909
 Attorney For Applicant(s)
 OKAMOTO & BENEDICTO LLP
 PH: (408) 436-2110
 FAX: (408) 436-2114

Enclosure(s)

CERTIFICATE OF MAILING			
I hereby certify that this correspondence, including the enclosures identified herein, is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. If the Express Mail Mailing Number is filled in below, then this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 CFR 1.10.			
Signature:	<u>Patrick Benedicto</u>		
Typed or Printed Name:	Patrick D. Benedicto	Dated:	April 22, 2004
Express Mail Mailing Number (optional):			



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	09/887,202	
	Filing Date	June 21, 2002	
	First Named Inventor	Thomas M. Pratt	
	Art Unit	1763	
	Examiner Name	Moore, Karla A	
Total Number of Pages in This Submission	12	Attorney Docket Number	10001.001100 (NVLS 432)

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) <i>(please identify below):</i> Request for Certificate of Correction; PTO Form SB-44 (in duplicate); Copy of Response to Office Action filed on Sept. 10, 2003; Return receipt postcard
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Patrick D. Benedicto, Reg No. 40,909 OKAMOTO & BENEDICTO LLP
Signature	<i>Patrick Benedicto</i>
Date	April 22, 2004

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.			
Typed or printed name	Patrick D. Benedicto		
Signature	<i>Patrick Benedicto</i>	Date	April 22, 2004

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

APR 28 2004

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : US 6,712,907

DATED : Mar. 30, 2004

INVENTOR(S) : Pratt, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

on column 7, line 42, after "acceleration", insert

-- ; and wherein the driven magnet array forms a magnetic rotation lock with the driving magnet array --

on column 8, line 13, after "acceleration", insert

-- ; and wherein the first magnet array forms a magnetic rotation lock with the second magnet array --

on column 8, lines 43-50, claim 19 should read,

-- A method for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:

placing a wafer on a carriage, the carriage having a first magnet array;
magnetically coupling an actuator to the carriage using a second magnet array to allow propulsion of the carriage, the actuator isolated from a vacuum environment;
forming a magnetic rotation lock between the first magnet array and the second magnet array; and
translating the actuator linearly. --

MAILING ADDRESS OF SENDER: Okamoto & Benedicto
P.O. Box 641330
San Jose, CA 95164-1330

PATENT NO. 6,712,907

No. of additional copies



This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

APR 28 2004

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : US 6,712,907

DATED : Mar. 30, 2004

INVENTOR(S) : Pratt, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

on column 7, line 42, after "acceleration", insert

– ; and wherein the driven magnet array forms a magnetic rotation lock with the driving magnet array –

on column 8, line 13, after "acceleration", insert

– ; and wherein the first magnet array forms a magnetic rotation lock with the second magnet array –

on column 8, lines 43-50, claim 19 should read,

– A method for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:

placing a wafer on a carriage, the carriage having a first magnet array;

magnetically coupling an actuator to the carriage using a second magnet array to

allow propulsion of the carriage, the actuator isolated from a vacuum environment;

forming a magnetic rotation lock between the first magnet array and the second

magnet array; and

translating the actuator linearly. –

MAILING ADDRESS OF SENDER: Okamoto & Benedicto
P.O. Box 641330
San Jose, CA 95164-1330

PATENT NO. 6,712,907

No. of additional copies

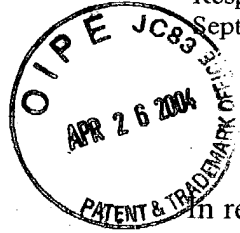


This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

APR 28 2004

Docket No. 10001.001100 (NVLS 432)
Response To Office Action
September 10, 2003



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Thomas M. Pratt et al.

Serial No. 09/887,202

Examiner: Moore, Karla A

Filing Date: June 21, 2001

Art Unit: 1763

Title: Magnetically Coupled Linear Servo-Drive Mechanism

Honorable Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO FINAL OFFICE ACTION

INTRODUCTORY COMMENTS

Sir:

This paper is responsive to the office action mailed on July 16, 2003 (hereinafter the "last office action").

Please amend the above-identified application as follows:

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A semiconductor wafer processing system, comprising:
a reactor for processing at least one semiconductor wafer;
at least one load lock coupled to the reactor; and
a magnetically coupled linear servo-drive mechanism located within the at least one load lock to transfer wafers to and from the reactor, the servo-drive mechanism comprising:

a carriage for holding a wafer;
a driven magnet array within the carriage;
a guiding mechanism for guiding the carriage linearly;
a cylindrical tube housing a linear actuator and isolating the actuator from a wafer environment in the load lock, a driving magnet array inside the cylindrical tube and mounted to an output of the linear actuator, the driving magnet array magnetically coupled to the driven magnet array mounted within the carriage;

an engine coupled to the actuator to drive the actuator; and
a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration; and

wherein the driven magnet array forms a magnetic rotation lock with the driving magnet array.

Claim 2 (original): The system of claim 1, wherein the reactor uses chemical vapor deposition.

Claim 3 (previously amended): The system of claim 1, wherein the driven magnet array includes permanent magnets that are radially aligned within the carriage and have alternating polarities.

Claim 4 (previously amended): The system of claim 3, wherein the actuator comprises:
a shaft coupled to a pulley system, the pulley system coupled to the engine;
and

a nut coupled to the driving magnet array, the driving magnet array including permanent magnets arranged radially and having alternating polarities, the nut being coupled to the shaft such that the nut moves axially along the length of the shaft when the shaft rotates.

Claim 5 (previously amended): The system of claim 4, wherein the driven magnet array includes at least two magnets having opposite polarities.

Claim 6 (previously amended): The system of claim 5, wherein the driving magnet array has the same number of magnets as the driven magnet array.

Claim 7 (original): The system of claim 1, wherein the guiding mechanism includes a linear ball slide.

Claim 8 (previously amended): The system of claim 1, wherein the cylindrical tube is non-magnetic.

Claim 9 (previously amended): The system of claim 4, wherein the shaft is a ball screw shaft.

Claim 10 (currently amended): A magnetically coupled linear servo-drive mechanism for use in a load lock of a semiconductor fabrication system, comprising:

- a carriage having a first magnet array;
 - a guiding mechanism for guiding the carriage linearly;
 - a cylinder housing an actuator, the actuator magnetically coupled to the carriage using a second magnet array;
 - an engine coupled to the actuator to drive the actuator; and
 - a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration; and
- wherein the first magnet array forms a magnetic rotation lock with the second magnet array.

Claim 11 (cancelled)

Claim 12 (previously amended): The magnetically coupled linear servo-drive mechanism of claim 10, wherein the first magnet array includes permanent magnets that are radially aligned within the carriage and have alternating polarities.

Claim 13 (previously amended): The magnetically coupled linear servo-drive mechanism of claim 12, wherein the actuator comprises:

- a shaft coupled to a pulley system, the pulley system coupled to the engine;
- a nut coupled to the second magnet array, the second magnet array includes permanent magnets arranged radially and having alternating polarities, the nut coupled to the shaft such that the nut moves axially along the length of the shaft when the shaft rotates.

Claim 14 (original): The magnetically coupled linear servo-drive mechanism of claim 13, wherein the first magnet array includes at least two magnets having opposite polarities.

Claim 15 (original): The magnetically coupled linear servo-drive mechanism of claim 14, wherein the second magnet array has the same number of magnets as the first magnet array.

Claim 16 (original): The magnetically coupled linear servo-drive mechanism of claim 10, wherein the guiding mechanism includes two guide shafts.

Claim 17 (original): The magnetically coupled linear servo-drive mechanism of claim 10, wherein the cylinder is non-magnetic.

Docket No. 10001.001100 (NVLS 432)
Response To Office Action
September 10, 2003

Claim 18 (previously amended): The magnetically coupled linear servo-drive mechanism of claim 13, wherein the shaft is a ball screw shaft.

Claim 19 (original): The magnetically coupled linear servo-drive mechanism of claim 13, further comprising a four-axis gimbal between the nut and the second magnet array.

Claim 20 (currently amended): A method for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:

placing a wafer on a carriage, the carriage having a first magnet array;
magnetically coupling an actuator to the carriage using a second magnet array to allow propulsion of the carriage and to form a rotation lock, the actuator isolated from a vacuum environment; and
forming a magnetic rotation lock between the first magnet array and the second magnet array; and
translating the actuator linearly.

Claim 21 (original): The method of claim 20, wherein the translating includes optimized motion.

Claim 22 (previously amended): A device for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:

means for placing a wafer on a carriage, the carriage having a first magnet array;
means for magnetically coupling an actuator to the carriage, the actuator isolated from a vacuum environment, the actuator having a second magnet array rotationally locked with the first magnet array; and
means for translating the actuator linearly.

REMARKS

With the above amendments, claims 1-10, and 12-22 remain in the application. Claim 11 has been cancelled.

In the last Office Action, claims 11 and 19 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 22 was also allowed. The Applicants thank the Examiner for deeming claims 11 and 19 allowable, and for allowing claim 22.

Independent claims 1, 10, and 20 have been amended to recite features of then claim 11. Claim 11 has been cancelled. Therefore, it is respectfully submitted that claims 1, 10, and 20 are now in condition for allowance. Dependent claims 2-9 ultimately depend on claim 1, dependent claims 12-19 ultimately depend on claim 10, and dependent claim 21 ultimately depend on claim 20. It is respectfully submitted that the aforementioned dependent claims are patentable at least for the same reasons that the claims they depend on are patentable.

For at least the foregoing reasons, it is respectfully submitted that claims 1-10, and 12-22 are now in condition for allowance. If the next communication is other than a Notice Of Allowance, the Examiner is invited to telephone the undersigned at (408)436-2112.

If for any reason an insufficient fee has been paid, the Commissioner is hereby authorized to charge the insufficiency to Deposit Account No. 50-2427.

///

///

///

///

///

Docket No. 10001.001100 (NVLS 432)
Response To Office Action
September 10, 2003

Respectfully yours,
Thomas M. Pratt et al.

Dated: September 10, 2003

Patrick D. Benedicto

Patrick D. Benedicto, Reg. No. 40,909
Okamoto & Benedicto LLP
P.O. Box 641330
San Jose, CA 95164
Tel.: (408)436-2110
Fax.: (408)436-2114

CERTIFICATE OF MAILING			
I hereby certify that this correspondence, including the enclosures identified herein, is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. If the Express Mail Mailing Number is filled in below, then this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 CFR 1.10.			
Signature:	<i>Patrick D. Benedicto</i>		
Typed or Printed Name:	Patrick D. Benedicto	Dated:	September 10, 2003
Express Mail Mailing Number (optional):			